

PATENT COOPERATION TREATY

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NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

CULLEN & CO.
Level 26
239 George Street
Brisbane, QLD 4000
AUSTRALIE

Date of mailing (day/month/year) 28 January 2002 (28.01.02)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 001464PC/RH	
International application No. PCT/AU00/00917	International filing date (day/month/year) 02 August 2000 (02.08.00)

1. The following indications appeared on record concerning:

☒ the applicant

 ☐ the inventor

 ☐ the agent

 ☐ the common representative

Name and Address	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person

 ☐ the name

 ☒ the address

 ☐ the nationality

 ☐ the residence

Name and Address DRD TECHNOLOGY PTY LTD 169 Carlton Terrace Manly, QLD 4179 Australia	State of Nationality AU	State of Residence AU
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:

DRD TECHNOLOGY PTY LTD has been added to the records as applicant only for all designated States except US. TRITCHLER, Robert, W. and EWING, Warren, A. are now applicant/inventor for US only.

4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
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The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Anne KARKACHI
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

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NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
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Applicant TRITCHLER, Robert, W. et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 20 February 2001 (20.02.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Claudio Borton
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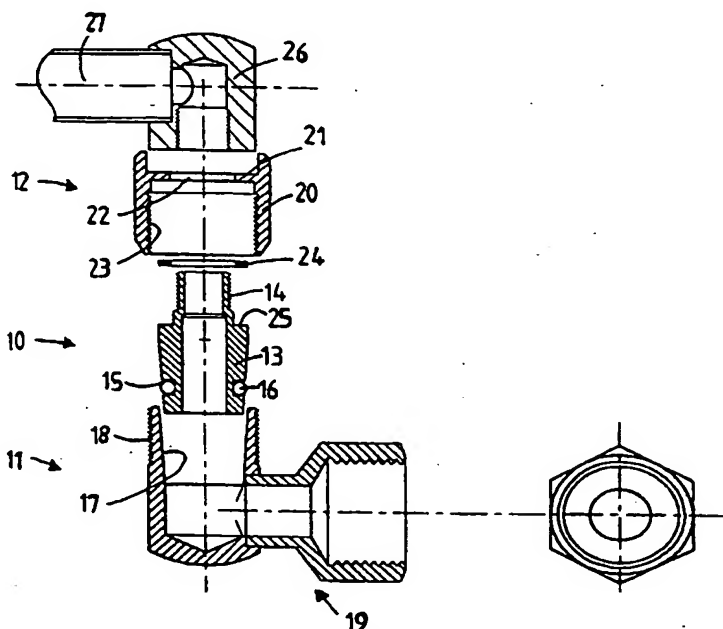
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(54) Title: SWIVEL JOINT



WO 01/11282 A1

(57) Abstract: A swivel joint which is particularly useful for shower heads. It comprises a first member (10) having an externally milled barrel (13) and a second member (11) having an internally milled barrel (17). The second member accommodates the first member in a leak-proof yet relatively rotatable relationship. The two members are held together by a collar (12).

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CLAIMS:

1. A swivel joint for connecting to a water line in a plumbing accessory outlet comprising a first member having an externally milled barrel and a second member having an internally milled barrel, wherein said second member accommodates said first member in a leak-proof yet relatively rotatable relationship, and wherein the first and second members are held together by a cylindrically shaped housing having an internal wall, offset from one end of the housing, with an opening therethrough.
2. A swivel joint as claimed in claim 1, wherein a recess is formed in the externally milled barrel of the first member which accommodates an o-ring.
3. A swivel joint as claimed in claim 2, wherein the barrel of the first member is tapered to facilitate assembly with the second member which has a complementary taper.
4. A swivel joint as claimed in claim 1, wherein the second member is adapted for connecting to the water line and the first member is adapted for connecting to an attachment.
5. A swivel joint as claimed in claim 4, wherein the first member has a screw thread on one end which mates with an internal screw thread formed in the attachment.
6. A swivel joint as claimed in claim 4, wherein the attachment is a shower head.
7. A swivel joint as claimed in claim 1, wherein the first member is integrally formed on an attachment.
8. A swivel joint as claimed in claim 7, wherein the attachment is a shower head.

9. A swivel joint as claimed in claim 1, wherein the second member is integrally formed on the water line.

5 10. A swivel joint as claimed in claim 1, wherein the housing is designed for tightening and untightening by hand.

10 11. A swivel joint as claimed in claim 1, wherein the housing includes an internal screw thread to one side of the wall which is designed to mate with an externally threaded stem on the end of the first member extending through the opening.

15 12. A swivel joint for connecting to a water line in a plumbing accessory outlet comprising a first element having a barrel with an externally projecting milled face, and a second element having a barrel with an externally projected milled face, wherein a resiliently
20 deformable sealing member is accommodated in one of the faces, and the first and second elements are held together in face-to-face relatively rotatable relationship by means of a cylindrically shaped housing having an internal wall, offset from one end of the
25 housing, with an opening therethrough.

13. A swivel joint as claimed in claim 12, wherein the resiliently deformable sealing member is an o-ring.

30 14. A swivel joint as claimed in claim 12, wherein the o-ring is located in a recess formed in the face of the second element.

15. A swivel joint as claimed in claim 12, wherein
35 the second element is adapted for connecting to the water line and the first element is adapted for connecting to an attachment.

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16. A swivel joint as claimed in claim 15, wherein the attachment is a shower head.

17. A swivel joint as claimed in claim 12, wherein
5 the housing is designed for tightening and untightening by hand.

[ART. 34]

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CLAIMS:

1. A swivel joint for connecting to a water line in a plumbing accessory outlet comprising a first member having an externally milled barrel and a second member
5 having an internally milled barrel, wherein said second member accommodates said first member in a leak-proof yet relatively rotatable relationship, and wherein the first and second members are held together by a cylindrically shaped housing having an internal wall, offset from one
10 end of the housing, with an opening therethrough.
2. A swivel joint as claimed in claim 1, wherein a recess is formed in the externally milled barrel of the first member which accommodates an o-ring.
15
3. A swivel joint as claimed in claim 2, wherein the barrel of the first member is tapered to facilitate assembly with the second member which has a complementary taper.
20
4. A swivel joint as claimed in claim 1, wherein the second member is adapted for connecting to the water line and the first member is adapted for connecting to an attachment.
25
5. A swivel joint as claimed in claim 4, wherein the first member has a screw thread on one end which mates with an internal screw thread formed in the attachment.
30
6. A swivel joint as claimed in claim 4, wherein the attachment is a shower head.
7. A swivel joint as claimed in claim 1, wherein
35 the first member is integrally formed on an attachment.
8. A swivel joint as claimed in claim 7, wherein the attachment is a shower head.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A swivel joint for connecting to a fluid line comprising a first member having an externally milled barrel and a second member having an internally milled barrel, wherein said second member accommodates said first member in a leak-proof yet relatively rotatable relationship, and wherein the first and second members are held together by a collar.
2. A swivel joint as claimed in claim 1, wherein a recess is formed in the externally milled barrel of the first member which accommodates an o-ring.
3. A swivel joint as claimed in claim 2, wherein the barrel of the first member is tapered to facilitate assembly with the second member which has a complementary taper.
4. A swivel joint as claimed in claim 1, wherein the second member is adapted for connecting to the fluid line and the first member is adapted for connecting to an attachment.
5. A swivel joint as claimed in claim 4, wherein the first member has a screw thread on one end which mates with an internal screw thread formed in the attachment.
6. A swivel joint as claimed in claim 4, wherein the fluid line is a water line and the attachment is a shower head.
7. A swivel joint as claimed in claim 1, wherein the first member is integrally formed on an attachment.
8. A swivel joint as claimed in claim 7, wherein the attachment is a shower head.

9. A swivel joint as claimed in claim 1, wherein the second member is integrally formed on the fluid line.
10. A swivel joint as claimed in claim 1, wherein the collar is a cylindrically shaped housing.
11. A swivel joint as claimed in claim 10, wherein the housing is designed for tightening and untightening by hand.
12. A swivel joint as claimed in claim 10, wherein the housing includes an internal wall, offset from one end of the housing, with an opening therethrough.
13. A swivel joint as claimed in claim 12, wherein the housing includes an internal screw thread to one side of the wall which is designed to mate with an externally threaded stem on the end of the first member extending through the opening.
14. A swivel joint for connecting to a fluid line comprising a first element having a barrel with an externally projecting milled face, and a second element having a barrel with an externally projected milled face, wherein a resiliently deformable sealing member is accommodated in one of the faces, and the first and second elements are held together in face-to-face relatively rotatable relationship by means of a collar.
15. A swivel joint as claimed in claim 14, wherein the resiliently deformable sealing member is an o-ring.
16. A swivel joint as claimed in claim 14, wherein the o-ring is located in a recess formed in the face of the second element.
17. A swivel joint as claimed in claim 14, wherein the second element is adapted for connecting to the fluid

line and the first element is adapted for connecting to an attachment.

18. A swivel joint as claimed in claim 17, wherein
5 the fluid line is a water line and the attachment is a shower head.

19. A swivel joint as claimed in claim 14, wherein
10 the collar is a cylindrically shaped housing.

20. A swivel joint as claimed in claim 19, wherein
the housing is designed for tightening and untightening
by hand.

15 21. A swivel joint as claimed in claim 19, wherein
the housing includes an internal wall, offset from one
end of the housing, with an opening therethrough.

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SWIVEL JOINT**BACKGROUND OF THE INVENTION**

This invention relates to swivel joints for use in connection with fluid lines and is particularly concerned with swivel joints which enable an attachment fitted to an end of a fluid line to be manually swivelled with respect to the fluid line and to retain the position to which it is swivelled.

There are many situations where it is desirable to have a swivelling or pivoting attachment on the end of a fixed fluid line, for instance, on the end of a water pipe. In the domestic environment, such products include shower heads, laundry faucet arms and kitchen faucet arms. Many other domestic and industrial situations also call for similar arrangements but those mentioned are the most common. Of these products, shower heads have the most prevalent problems and the present invention arises out of a desire to overcome those problems. The invention will therefore be particularly described with respect to shower heads but it is to be borne in mind that the invention is not limited to such products but has broader ramifications and applications. Such broader ramifications and applications will be readily apparent to the skilled addressee.

DESCRIPTION OF THE PRIOR ART

The most common type of shower head arrangement on the Australian market is the "all directional" shower head. This comprises an oval tablet-shaped shower head fitted to the end of a relatively long arm. The arm is pivotable through an arc with respect to a fixed water outlet protruding from the shower wall, and the head is pivotable through an arc with respect to a perpendicular housing on the opposite end of the arm. The head is also rotatable through 360° at a position adjacent to where it pivots - hence the name "all directional" shower head.

A problem with such shower head arrangements is that following repeated swivelling, either the washers between the swivelling sections wear to such an extent that leakage occurs, or the connections work loose and either leakage occurs or the shower head hangs down limply. Furthermore, the design of such connections make it difficult to tighten the joints sufficiently to prevent leakage and to also orientate the shower head in the desired position.

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In an attempt to address these problems, various improvements have been devised, with the result that leakage is now reduced to some extent. However the connections have not fully addressed the tendency of the head to droop after continued use or ease of adjustment.

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A partial solution has been to provide a winged hex key for tightening the hinge connection nut however this has a tendency to get mislaid. A recent proposal has been to form a key integral with the connection however from aesthetic considerations the key has to be small and making it small makes it difficult for women, children and the infirm to properly tighten.

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OBJECT OF THE INVENTION

It is therefore an object of the present invention to provide a new form of swivel joint which fully addresses the aforementioned problem and which provides an aesthetically pleasing product which can be economically produced.

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SUMMARY OF THE INVENTION

According to one aspect of the invention there is provided a swivel joint for connecting to a fluid line comprising a first member having an externally milled barrel and a second member having an internally milled barrel, wherein said second member accommodates said first member in a leak-proof yet relatively rotatable relationship, and wherein the first and second members

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are held together by a collar.

According to a second aspect of the invention there is provided a swivel joint for connecting to a fluid line comprising a first element having a barrel with an externally projected milled face, and a second element also having a barrel with an externally projected milled face, wherein a resiliently deformable sealing member is accommodated in one of the faces, and the first and second elements are held together in face-to-face relatively rotatable relationship by means of a collar. Preferably, the resiliently deformable sealing member is an o-ring.

The fluid line typically comprises a pipe with a rotatable attachment on one end thereof, such as the aforementioned "all directional" shower head.

DETAILED DESCRIPTION OF THE INVENTION

The milling of the barrels is perfected to a very fine tolerance to ensure that there is no possibility of leakage of fluid between them. However, to avoid the possibility of "lock up" between the surfaces due to the temperature or composition of the materials in the passing fluid, a polymeric (for instance teflon 66®) or hydrocarbon (for instance high viscosity grease) coating can be applied to one or both of the surfaces. Such "lock up" can also be addressed in the first mentioned embodiment by including an o-ring in a recess formed in the externally milled barrel. An o-ring is however, primarily useful for providing a secondary water-tight seal as well as enabling the joint to be disassembled or "cracked" if such an occasion should arise. Preferably, both a coating and an o-ring are used when the barrels are milled from metal, such as brass. However an o-ring can be useful alone in the case where one or both of the barrels are moulded from high density

plastics material such as polytetrafluoroethylene, nylon 66®, or the like.

The barrel milled on the first member in the first of the two embodiments defined above, can be either of a cylindrical or tapered form, preferably the later. A tapered form facilitates assembly and also enables reseating of the barrel if necessary. The barrel milled on the end of the second member will obviously have a complementary shape to that of the first member. A major advantage of the tapered barrel is the mechanical advantage this gives to enable the joint to be tightened up to a stage where it holds the arm and shower head in any position required with relatively light forces required to tighten the collar.

The barrel milled on the first member or first element can be formed either integrally with the fluid line/attachment or it can be fitted thereto such as by means of a screw threaded connection. Preferably, it is screw threaded to the fluid line/attachment by virtue of an external screw thread on the end of the barrel which mates with an internal screw thread formed in the fluid line/attachment.

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The complementary shaped barrel on the second member or second element can likewise be either formed integrally with the second member or element or it can be fitted thereto by a screw threaded or like connection. Preferably it is formed integrally with the second member or element.

The collar is suitably a cylindrically shaped housing which holds the first and second members together. Preferably it is a thumb-screw housing enabling the two members to be tightened together to the required relative configuration by an almost effortless finger action. However, it can be fitted in the factory

in such a manner that finger tightening is not necessary.

The former arrangement is preferred as it enables disassembly of the joint and also enables service of the joint if this should ever be necessary during the life of the product.

In a preferred form of the invention, the collar includes an internal wall, offset from one end thereof, and an internal screw-thread to one side of the wall. The internal wall has an opening through which an externally threaded stem on the end of the first member can extend to enable the first member to be screwed into the fluid line and retain the wall of the collar therebetween. If necessary, a fibre or plastics material washer can be accommodated between the opening in the collar wall and the stem on the first member. Alternatively, or in addition, a coil spring can be located over the stem of the first member.

The internal screw-threaded region of the collar is adapted to connect with an external screw-threaded region on the second barrel of the second member, thereby enabling the two sections of the joint to be held together and tightened or loosened as appropriate.

The swivel joint according to the invention provides a leak-proof joint which can pivot and maintain any desired position which it is pivoted to. Further, in one preferred arrangement, it can be tightened by a simple finger action, thereby meeting the objects of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an exploded cross-sectional view of a first swivel joint according to one aspect of the present invention,

Figure 2 is an assembled cross-sectional view of the swivel joint of Figure 1,

Figure 3 is an assembled exterior view of the swivel joint of Figure 1,

Figure 4 is an exploded cross-sectional view of a second swivel joint according to a first aspect of the present invention,

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Figure 5 is an assembled cross-sectional view of the swivel joint of Figure 4,

Figure 6 is an assembled exterior view of the swivel joint of Figure 4,

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Figure 7 is an exploded cross-sectional view of a third swivel joint according to a first aspect of the present invention,

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Figure 8 is an assembled cross-sectional view of the swivel joint of Figure 7,

Figure 9 is an assembled exterior view of the swivel joint of Figure 7,

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Figure 10 is an exploded cross-sectional view of a first swivel joint according to a second aspect of the present invention,

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Figure 11 is an assembled cross-sectional view of the swivel joint of Figure 10,

Figure 12 is an assembled exterior view of the swivel joint of Figure 11,

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Figure 13 is an exploded cross-sectional view of a second swivel joint according to a second aspect of the present

invention,

Figure 14 is an assembled cross-sectional view of the swivel joint of Figure 13,

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Figure 15 is an assembled exterior view of the swivel joint of Figure 13,

Figure 16 is a side on view of two swivel joints in a water line, and

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Figure 17 is a plan view of the arrangement depicted in Figure 16.

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DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments of the invention will now be described with reference to the accompanying drawings in all of which like reference numerals refer to like parts.

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Referring firstly to Figure 1, the first swivel joint comprises a first member 10, a second member 11 and a collar 12.

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The first member 10 includes an externally tapered brass barrel 13 and an externally screw-threaded stem 14 of reduced diameter. A groove 15 is formed in the lower tapered end of the brass barrel and an o-ring 16 is seated therein. The screw-threaded stem 14 screws

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into a complementary screw-threaded housing 26 formed on the end of an attachment 27, such as a shower head, in the water line. The taper on the barrel 13 is approximately 7° inclusive.

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The second member 11 includes an internally tapered surface 17 which is complementary in shape to the taper on the barrel 13. A screw thread 18 is formed on the external wall of the second member 11, and an inlet

19 is formed integrally therewith. The internally tapered surface 17 is preferably coated with a suitable grease to prevent the first and second members locking up.

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The collar 12 comprises a cylindrical walled housing 20 with an internal transverse wall 21 towards one end thereof. The internal transverse wall 12 includes an opening 22 and there is an internal screw thread 23 on the casting which matches the external screw thread 18 on the second member. The outer surface of the collar 12 is grooved 29 (see Figure 3) to facilitate rotation by hand.

15 A plastic washer 24 locates between the collar 12 and a ledge 25 formed on the first member 10.

Figure 2 shows how the components of Figure 1 are fitted together in use. The arrangement permits rotational movement of the attachment 27 relative to the inlet 19 without loosening of the collar 12. Should, however, the attachment 27 become loose due to continued pivoting over a period of time, it can readily be tightened by simply rotating the collar 12 by slight finger pressure.

Figure 3 shows the external view of the swivel joint and illustrates the pleasing aesthetic appearance as well as the easily manipulable collar 29.

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Figures 4, 5 and 6 illustrate an embodiment which is very similar to Figures 1, 2 and 3 but which differs in that a spring 30 is located between the tapered brass barrel 31 and the internal wall 21 of the collar. It will also be noted that the ledge 32 on which the spring seats is lower than in the former embodiment, and there is an internal washer.

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The purpose of the spring is to apply a predetermined pressure on the tapered plug/seat sufficient to maintain a continuous tightness to the joint without the need to adjust the tension via the threaded collar 20. It is envisaged that this embodiment will not require the need for any adjustment at all, as this will be achieved by the spring. It can be seen that this in turn can do away with the need for the thread 23 on the collar and the thread 18 as long as the collar provides a means of anchoring the collar 12 to the barrel 11 and still allow for rotation.

Figures 7, 8 and 9 illustrate a modified version of the Figures 1, 2 and 3 embodiment in which the barrel 40 and the second member 41 are not tapered but are of a uniform cylindrical dimension. Thrust washers 42, 45 are included to prevent abrasive action respectively between the barrel lip 43 and the inner wall 44 of the collar and between the barrel lip 43 and the seat of the barrel 41.

Figures 10, 11 and 12 illustrate the second aspect of the invention wherein rotation occurs about the milled end faces 50, 51 of the respective first element 57 and second element 53. An o-ring 54 located in a groove is formed in the end face 51 ensures that an integral seal is formed between the end faces when they are clamped together by the collar 12 as shown in Figure 11. A thrust washer is shown at 56.

Figures 13, 14 and 15 illustrate a modification of the embodiment shown in Figures 10, 11 and 12 wherein the o-ring 60 is now located in a groove 61 formed in the end face 62 of the first element 63 rather than in the end face 64 of the second element 66. A thrust washer is shown at 67.

Figures 16 and 17 illustrate a typical pivoting

shower head arrangement incorporating two swivel joints of one of the types previously described. The arrangement consists of a shower head 70 which is rotatable through 360° adjacent its head by a conventional pivoting joint 71. A first swivel joint 72 is provided adjacent the head 70 and a second swivel joint 73 is provided at the wall inlet 74. Both joints are separated by a conventional rigid arm 75 of approximately 20-30cm in length.

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Such an arrangement enables all directional movement of the shower head without leakage at the joints or drooping of the head. Any slight loosening which occurs following repeated and continual adjustment by the shower heads can be readily corrected by rotating the knurled collars 67 in the appropriate direction by hand.

Whilst the above has been given by way of illustrative example of the invention, many modifications and variation may be made thereto by persons skilled in the art without departing from the broad scope and ambit of the invention as herein set forth.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A swivel joint for connecting to a fluid line comprising a first member having an externally milled barrel and a second member having an internally milled barrel, wherein said second member accommodates said first member in a leak-proof yet relatively rotatable relationship, and wherein the first and second members are held together by a collar.
2. A swivel joint as claimed in claim 1, wherein a recess is formed in the externally milled barrel of the first member which accommodates an o-ring.
3. A swivel joint as claimed in claim 2, wherein the barrel of the first member is tapered to facilitate assembly with the second member which has a complementary taper.
4. A swivel joint as claimed in claim 1, wherein the second member is adapted for connecting to the fluid line and the first member is adapted for connecting to an attachment.
5. A swivel joint as claimed in claim 4, wherein the first member has a screw thread on one end which mates with an internal screw thread formed in the attachment.
6. A swivel joint as claimed in claim 4, wherein the fluid line is a water line and the attachment is a shower head.
7. A swivel joint as claimed in claim 1, wherein the first member is integrally formed on an attachment.
8. A swivel joint as claimed in claim 7, wherein the attachment is a shower head.

9. A swivel joint as claimed in claim 1, wherein the second member is integrally formed on the fluid line.
10. A swivel joint as claimed in claim 1, wherein the collar is a cylindrically shaped housing.
11. A swivel joint as claimed in claim 10, wherein the housing is designed for tightening and untightening by hand.
12. A swivel joint as claimed in claim 10, wherein the housing includes an internal wall, offset from one end of the housing, with an opening therethrough.
13. A swivel joint as claimed in claim 12, wherein the housing includes an internal screw thread to one side of the wall which is designed to mate with an externally threaded stem on the end of the first member extending through the opening.
14. A swivel joint for connecting to a fluid line comprising a first element having a barrel with an externally projecting milled face, and a second element having a barrel with an externally projected milled face, wherein a resiliently deformable sealing member is accommodated in one of the faces, and the first and second elements are held together in face-to-face relatively rotatable relationship by means of a collar.
15. A swivel joint as claimed in claim 14, wherein the resiliently deformable sealing member is an o-ring.
16. A swivel joint as claimed in claim 14, wherein the o-ring is located in a recess formed in the face of the second element.
17. A swivel joint as claimed in claim 14, wherein the second element is adapted for connecting to the fluid

line and the first element is adapted for connecting to an attachment.

18. A swivel joint as claimed in claim 17, wherein
5 the fluid line is a water line and the attachment is a shower head.

19. A swivel joint as claimed in claim 14, wherein
10 the collar is a cylindrically shaped housing.

20. A swivel joint as claimed in claim 19, wherein
the housing is designed for tightening and untightening
by hand.

15 21. A swivel joint as claimed in claim 19, wherein
the housing includes an internal wall, offset from one
end of the housing, with an opening therethrough.

AMENDED CLAIMS

[received by the International Bureau on 18 December 2000 (18.12.00);
original claim 1 amended; remaining claims unchanged (3 pages)]

1. A swivel joint for connecting to a water line in a plumbing accessory outlet comprising a first member having an externally milled barrel and a second member having an internally milled barrel, wherein said second member accommodates said first member in a leak-proof yet relatively rotatable relationship, and wherein the first and second members are held together by a collar.
2. A swivel joint as claimed in claim 1, wherein a recess is formed in the externally milled barrel of the first member which accommodates an o-ring.
3. A swivel joint as claimed in claim 2, wherein the barrel of the first member is tapered to facilitate assembly with the second member which has a complementary taper.
4. A swivel joint as claimed in claim 1, wherein the second member is adapted for connecting to the fluid line and the first member is adapted for connecting to an attachment.
5. A swivel joint as claimed in claim 4, wherein the first member has a screw thread on one end which mates with an internal screw thread formed in the attachment.
6. A swivel joint as claimed in claim 4, wherein the fluid line is a water line and the attachment is a shower head.
7. A swivel joint as claimed in claim 1, wherein the first member is integrally formed on an attachment.
8. A swivel joint as claimed in claim 7, wherein the attachment is a shower head.

9. A swivel joint as claimed in claim 1, wherein the second member is integrally formed on the fluid line.

10. A swivel joint as claimed in claim 1, wherein the collar is a cylindrically shaped housing.

11. A swivel joint as claimed in claim 10, wherein the housing is designed for tightening and untightening by hand.

12. A swivel joint as claimed in claim 10, wherein the housing includes an internal wall, offset from one end of the housing, with an opening therethrough.

13. A swivel joint as claimed in claim 12, wherein the housing includes an internal screw thread to one side of the wall which is designed to mate with an externally threaded stem on the end of the first member extending through the opening.

14. A swivel joint for connecting to a water line in a plumbing accessory outlet comprising a first element having a barrel with an externally projecting milled face, and a second element having a barrel with an externally projected milled face, wherein a resiliently deformable sealing member is accommodated in one of the faces, and the first and second elements are held together in face-to-face relatively rotatable relationship by means of a collar.

15. A swivel joint as claimed in claim 14, wherein the resiliently deformable sealing member is an o-ring.

16. A swivel joint as claimed in claim 14, wherein the o-ring is located in a recess formed in the face of the second element.

17. A swivel joint as claimed in claim 14, wherein

the second element is adapted for connecting to the fluid line and the first element is adapted for connecting to an attachment.

5 18. A swivel joint as claimed in claim 17, wherein the fluid line is a water line and the attachment is a shower head.

19. A swivel joint as claimed in claim 14, wherein
10 the collar is a cylindrically shaped housing.

20. A swivel joint as claimed in claim 19, wherein the housing is designed for tightening and untightening by hand.

15

21. A swivel joint as claimed in claim 19, wherein the housing includes an internal wall, offset from one end of the housing, with an opening therethrough.

20

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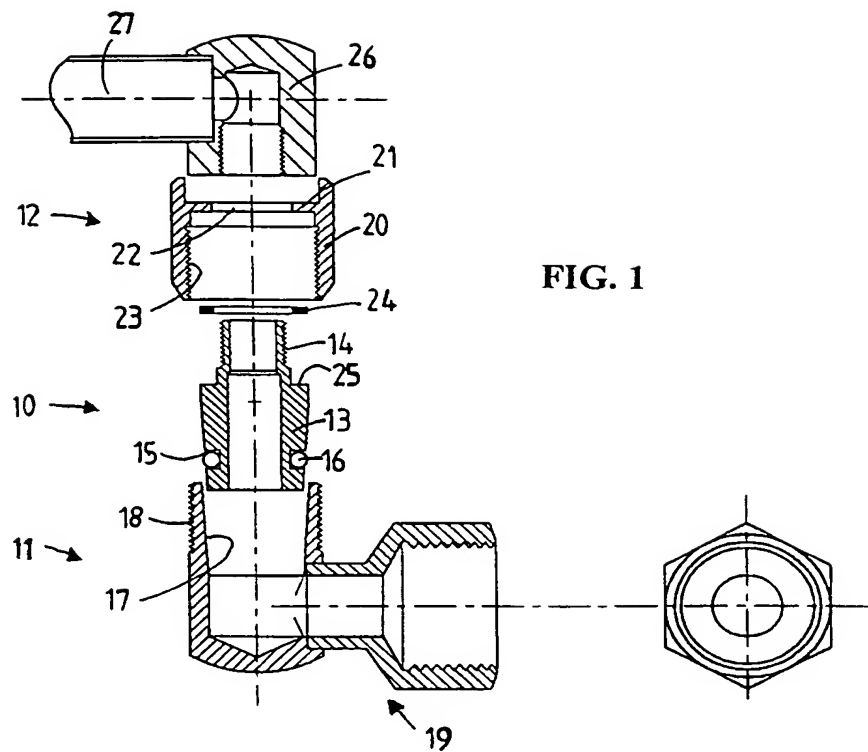


FIG. 1

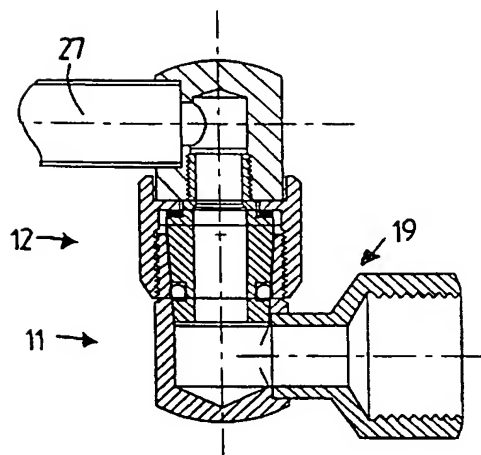


FIG. 2

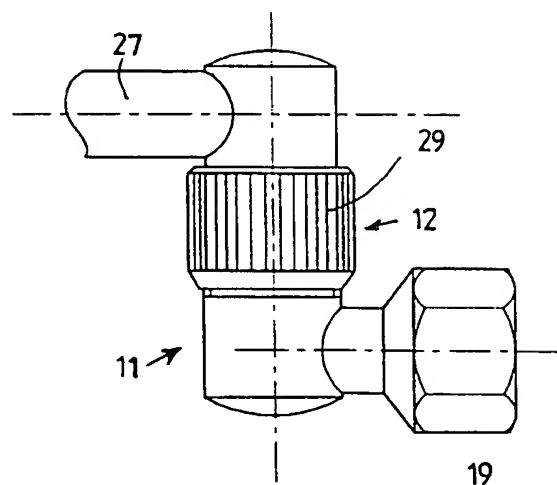
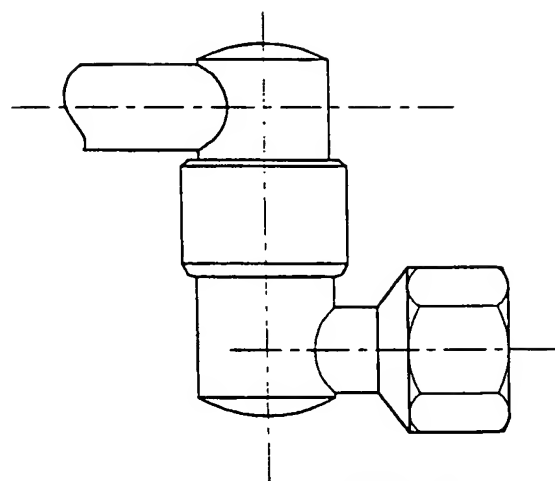
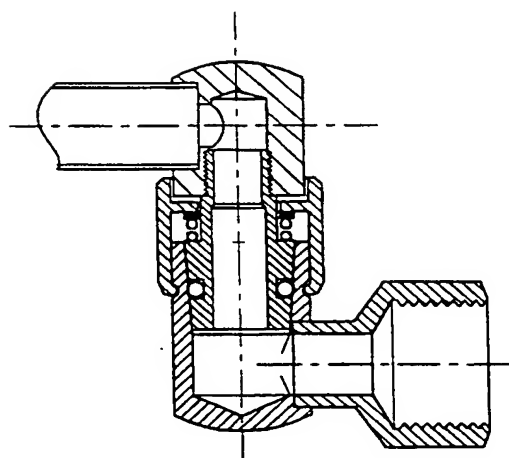
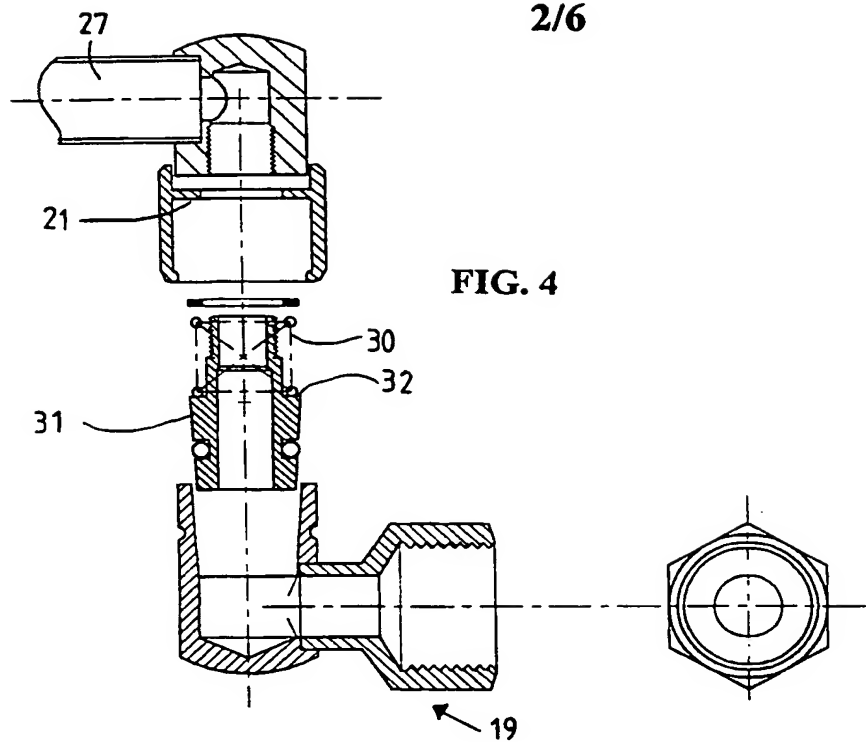


FIG. 3

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FIG. 7

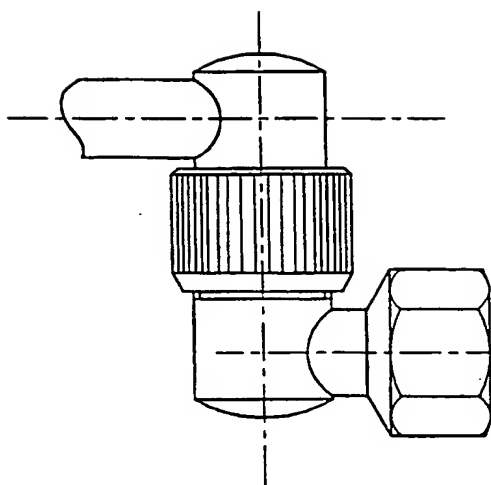
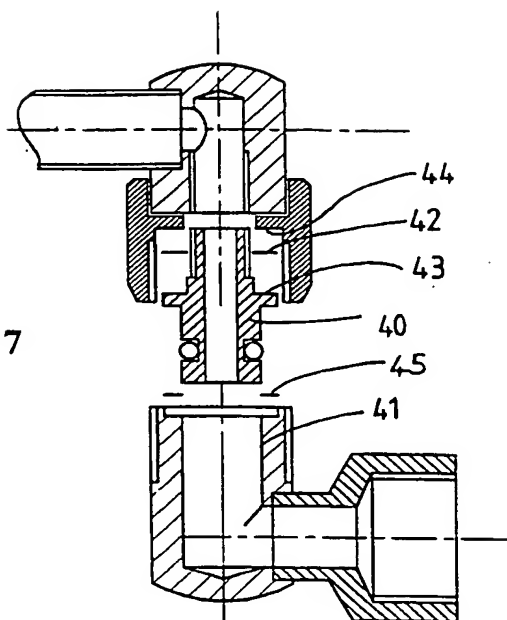


FIG. 9

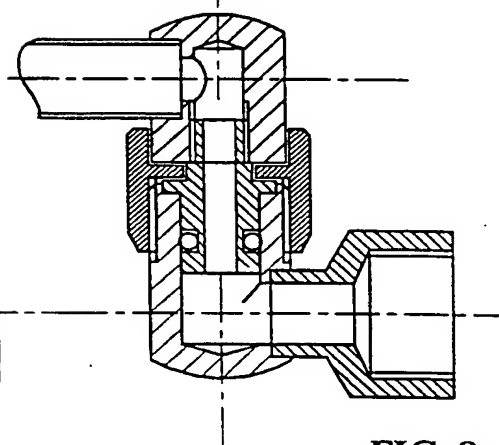


FIG. 8

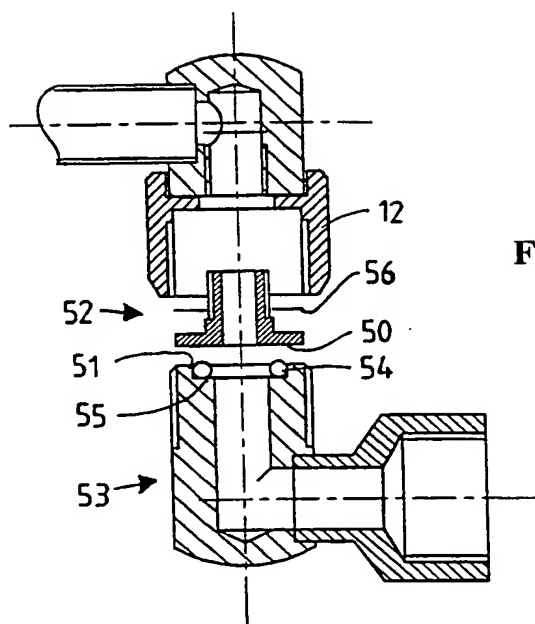


FIG. 10

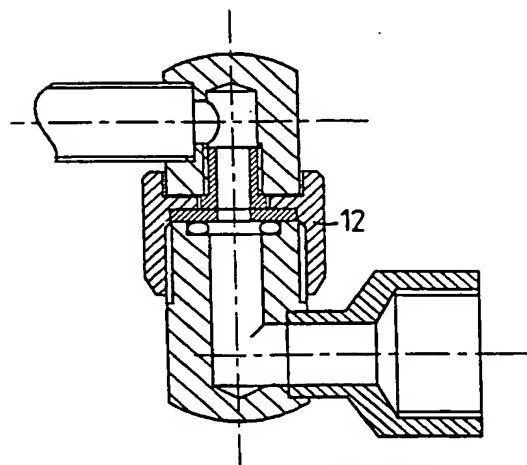


FIG. 11

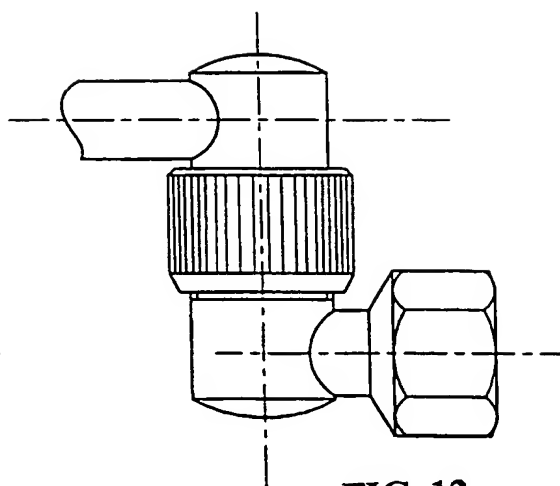


FIG. 12

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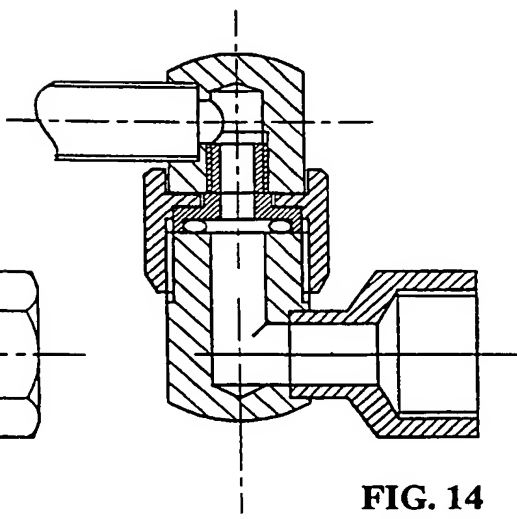
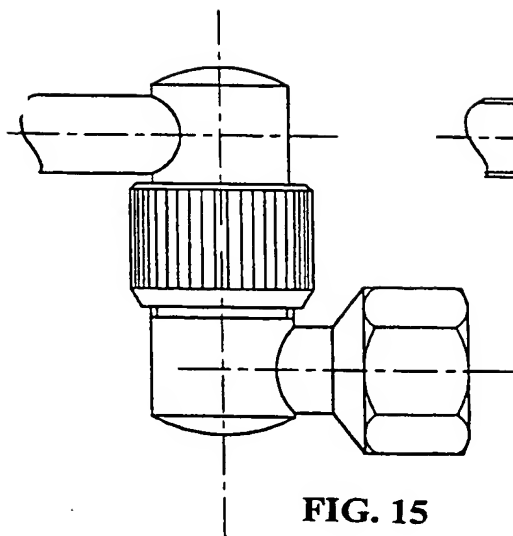
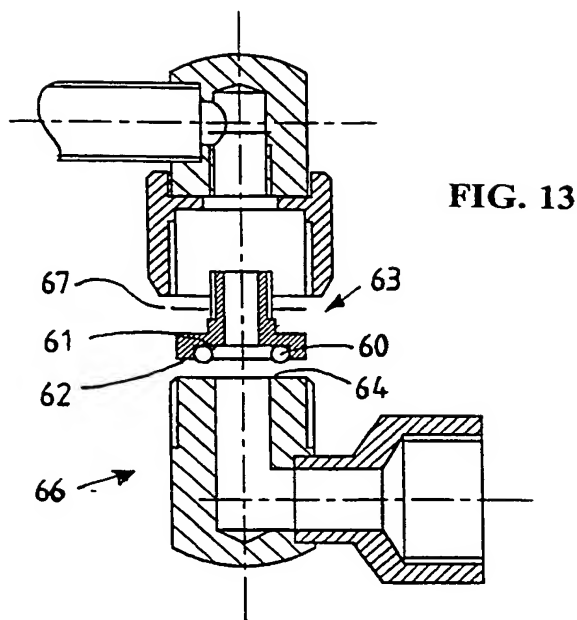


FIG. 16

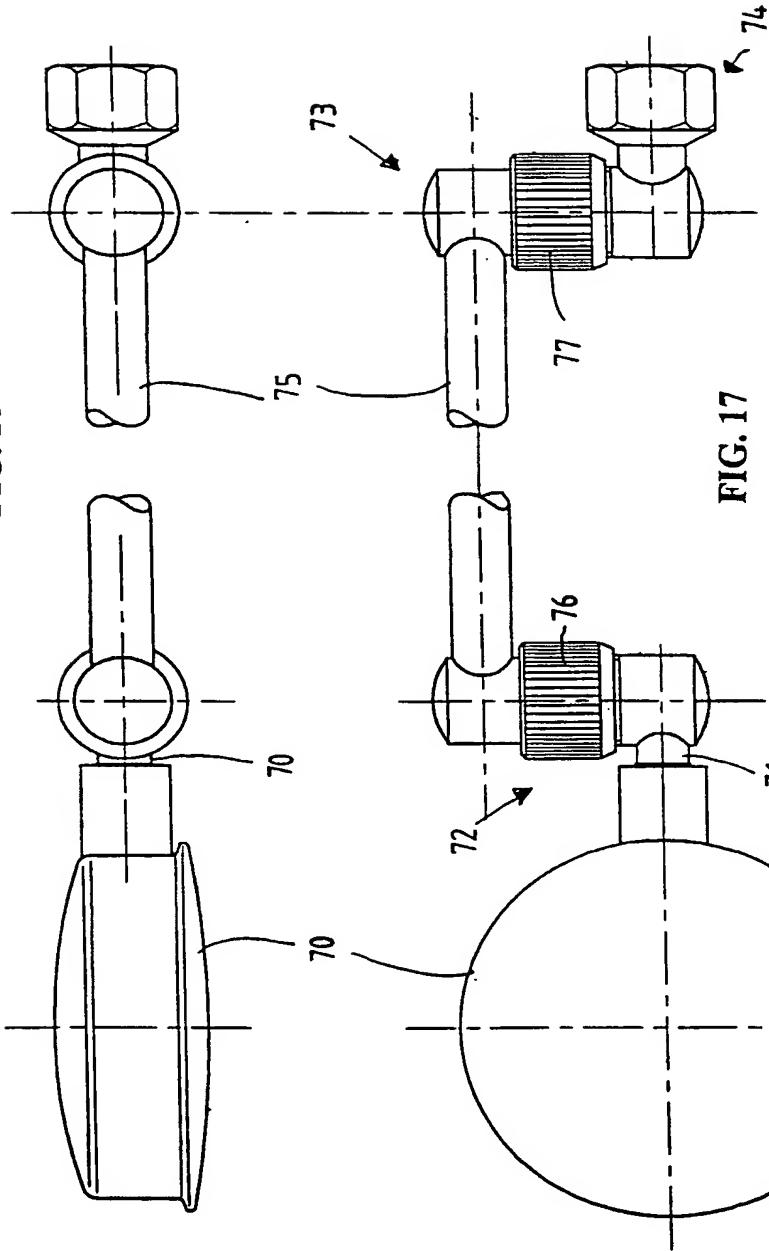
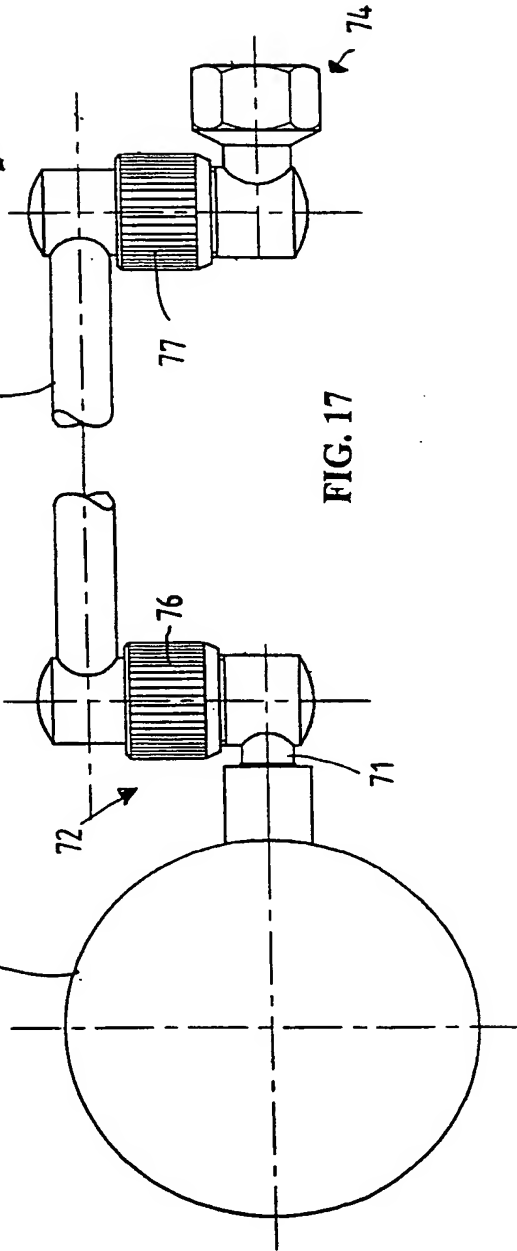


FIG. 17



INTERNATIONAL SEARCH REPORT

 International application No.
 PCT/AU 00/00917

A. CLASSIFICATION OF SUBJECT MATTER		
Int Cl ⁷ : F16L 27/08, A47K 3/28		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC: F16L 27/08, A47K 3/22, A47K 3/28		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU: IPC as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2070177, A, (SOCIETE NATIONALE ELF AQUITAINE (PRODUCTION) TOUR AQUITAINE) 3 September 1981	1,4,5,6,7,9,10,11
Y	See entire document	8
X	AU 36609/95, A, (LONGWALL ROOF SUPPORTS LIMITED) 9 May 1995	1 to 7, 9 to 11
Y	See entire document	8
X	US 3957293, A (RODGERS) 18 May 1976	1 to 7, 9 to 11
X	See entire document	
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
* Special categories of cited documents: "A" Document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or parent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 03 October 2000		Date of mailing of the international search report 17 OCT 2000
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA E-mail address: pct@ipaustalia.g v.au Facsimile No.: (02) 6285 3929		Authorized officer R. WEBER Telephone No.: (02) 6283 2546

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU 00/00917

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2506891, A (GUERRI) 3 December 1982 See entire document	1 to 7, 9 to 11 14 to 17, 19, 20
X	DE 4109003 C, (DORNBRACHT GMBT & CO) 27 May 1992 See entire document	1 to 11, 14 to 20
X	WO 9635070 A (STOL CO STOL TENBERG-LERCHE) 7 November 1996 See entire document	1 to 7, 9 to 11 14 to 17 19,20
X	Derwent Abstract Accession No 99-290994/25 Class Q67, JP 11094144, A, (BRIDGESTONE CORP) 9 April 1999 See entire application	1 to 7 9 to 11

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/AU 00/00917

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
GB	2070177	AU	67550/81	CA	1164909	DE	3106399
		FR	2476794	IT	1135550	NO	810580
		US	4427218				
AU	36609/95	DE	19540343	GB	2294741	US	5735552
US	3957293	CA	1022586	CH	578144	DE	2457368
		US	3957293				
WO	9635070	DE	19516115	EP	823033	NO	975081
		US	6003907				

REC'D 13 JUN 2001

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Applicant's or agent's file reference 001464	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).	
International application No. PCT/AU 00/00917	International filing date (day/month/year) 02 August 2000	Priority Date (day/month/year) 09 August 1999
International Patent Classification (IPC) or national classification and IPC Int. Cl.⁷ F16L 27/08, A47K 3/28		
Applicant 1. TRITCHLER, Robert W.(et.)		

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.																
2.	<p>This REPORT consists of a total of 3 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 3 sheet(s).</p>																
3.	<p>This report contains indications relating to the following items:</p> <table border="0"> <tr> <td>I</td> <td><input checked="" type="checkbox"/> Basis of the report</td> </tr> <tr> <td>II</td> <td><input type="checkbox"/> Priority</td> </tr> <tr> <td>III</td> <td><input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td>IV</td> <td><input type="checkbox"/> Lack of unity of invention</td> </tr> <tr> <td>V</td> <td><input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td>VI</td> <td><input type="checkbox"/> Certain documents cited</td> </tr> <tr> <td>VII</td> <td><input type="checkbox"/> Certain defects in the international application</td> </tr> <tr> <td>VIII</td> <td><input type="checkbox"/> Certain observations on the international application</td> </tr> </table>	I	<input checked="" type="checkbox"/> Basis of the report	II	<input type="checkbox"/> Priority	III	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	IV	<input type="checkbox"/> Lack of unity of invention	V	<input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	VI	<input type="checkbox"/> Certain documents cited	VII	<input type="checkbox"/> Certain defects in the international application	VIII	<input type="checkbox"/> Certain observations on the international application
I	<input checked="" type="checkbox"/> Basis of the report																
II	<input type="checkbox"/> Priority																
III	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability																
IV	<input type="checkbox"/> Lack of unity of invention																
V	<input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement																
VI	<input type="checkbox"/> Certain documents cited																
VII	<input type="checkbox"/> Certain defects in the international application																
VIII	<input type="checkbox"/> Certain observations on the international application																

Date of submission of the demand 20 February 2001	Date of completion of the report 10 May 2001
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer R. WEBER Telephone No. (02) 6283 2546

I. Basis of the report1. With regard to the **elements** of the international application:*

- ☐ the international application as originally filed.
- ☒ the description, pages **1 to 10**, as originally filed,
pages , filed with the demand,
pages , received on with the letter of .
- ☒ the claims, pages , as originally filed,
pages , as amended (together with any statement) under Article 19,
pages , filed with the demand,
pages **11,12, 13**, received on **10 April 2001** with the letter of **10 April 2001**.
- ☒ the drawings, pages **1 to 6**, as originally filed,
pages , filed with the demand,
pages , received on with the letter of .
- ☐ the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of .

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, was on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1 to 17	YES
	Claims	NO
Inventive step (IS)	Claims 1 to 17	YES
	Claims	NO
Industrial applicability (IA)	Claims 1 to 17	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

NOVELTY (N) AND INVENTIVE STEP (IS) CLAIMS 1 to 17.

Claims 1 to 17.

The invention of the amended claims is to a:-

A swivel joint for connecting to a water line in a plumbing accessory outlet comprising a first member having an externally milled barrel and a second member having an internally milled barrel, wherein said second member accomodates said first member in a leak-proof yet relatively rotatable relationship, and wherein the first and second members are held together by a cylindrically shaped housing having an internal wall, offset from one end of the housing, with an opening therethrough.

No individual citation or obvious combination of citations discloses the above arrangement.

The closest art maybe seenin the folowing documents:-

DE 410036C, JP 11094144A, GB 2070177A, AU 36609/95A, US 3957293A, FR 2506891A, WO 9635070A.

INDUSTRIAL APPLICABILITY (IA) CLAIMS 1 to 17.

All claims are considered to be industrially applicable.

CLAIMS:

1. A swivel joint for connecting to a water line in a plumbing accessory outlet comprising a first member having an externally milled barrel and a second member
5 having an internally milled barrel, wherein said second member accommodates said first member in a leak-proof yet relatively rotatable relationship, and wherein the first and second members are held together by a cylindrically shaped housing having an internal wall, offset from one
10 end of the housing, with an opening therethrough.
2. A swivel joint as claimed in claim 1, wherein a recess is formed in the externally milled barrel of the first member which accommodates an o-ring.
15
3. A swivel joint as claimed in claim 2, wherein the barrel of the first member is tapered to facilitate assembly with the second member which has a complementary taper.
20
4. A swivel joint as claimed in claim 1, wherein the second member is adapted for connecting to the water line and the first member is adapted for connecting to an attachment.
25
5. A swivel joint as claimed in claim 4, wherein the first member has a screw thread on one end which mates with an internal screw thread formed in the attachment.
30
6. A swivel joint as claimed in claim 4, wherein the attachment is a shower head.
7. A swivel joint as claimed in claim 1, wherein
35 the first member is integrally formed on an attachment.
8. A swivel joint as claimed in claim 7, wherein the attachment is a shower head.

9. A swivel joint as claimed in claim 1, wherein the second member is integrally formed on the water line.
- 5 10. A swivel joint as claimed in claim 1, wherein the housing is designed for tightening and untightening by hand.
- 10 11. A swivel joint as claimed in claim 1, wherein the housing includes an internal screw thread to one side of the wall which is designed to mate with an externally threaded stem on the end of the first member extending through the opening.
- 15 12. A swivel joint for connecting to a water line in a plumbing accessory outlet comprising a first element having a barrel with an externally projecting milled face, and a second element having a barrel with an externally projected milled face, wherein a resiliently
20 deformable sealing member is accommodated in one of the faces, and the first and second elements are held together in face-to-face relatively rotatable relationship by means of a cylindrically shaped housing having an internal wall, offset from one end of the
25 housing, with an opening therethrough.
13. A swivel joint as claimed in claim 12, wherein the resiliently deformable sealing member is an o-ring.
- 30 14. A swivel joint as claimed in claim 12, wherein the o-ring is located in a recess formed in the face of the second element.
- 35 15. A swivel joint as claimed in claim 12, wherein the second element is adapted for connecting to the water line and the first element is adapted for connecting to an attachment.

16. A swivel joint as claimed in claim 15, wherein the attachment is a shower head.

17. A swivel joint as claimed in claim 12, wherein
5 the housing is designed for tightening and untightening by hand.